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Morrow Project Rail Program Notes:

Most of what has been published about the Morrow Project includes small individual teams, and huge bases with awesome displays of high technology. On the other hand, a project as daunting as the reconstruction of the North American continent after a nuclear war has to have elements that are more down to earth.

A big problem would seem to be fuel. However, the United States has enough coal to last hundreds if not thousands of years at its current consumption. A lot of it is easily accessed with earthmoving equipment. After a war of such magnitude, no one is going to care too much about who has the legal title to such land.

The first major stumbling block is transportation. Airlift lacks the capacity to move huge amounts of material, and it is frightfully wasteful of fuel. At sea, most major ports will have been nuked. The only transportation network that will even somewhat intact are the highways and rail.

With limited resources, rail transportation is the way to go. It takes a lot less effort to keep a mile of track operational than a mile of road, and the cost per ton of transport is much lower. And, last of all, the United States was switching from coal locomotives to Diesel/Electrics at the time the Morrow Project was beginning, and the obsolete steam locomotives could be had for the price of scrap...

Service and Support Team IS-2 Ludlow CA

Team IS-2 is located in a small, caved-in mine shaft north and west of Ludlow, about forty miles east of Barstow. It was unclear to the Project planners whether or not Barstow or Mojave, semi-major rail centers, would be hit in a nuclear exchange. These junctions would be vital in getting produce and oil to and from California into the rest of the nation. Also in the area are Fort Irwin, Edwards Air Force Base and Twentynine Palms Marine Corps base. Downtown Los Angeles is only 100 miles and a low mountain range away.

The team's initial job would be to repair a bypass of the Barstow and/or Mojave junctions and re-establish the engine maintenance facilities there, if possible. Because of the possibly of severe radiation hazards, the team has been assigned a High Capacity Armored Tractor (HCAT) with an Engineering attachment. This vehicle is similar to the Scientific One vehicle- -the Scientific One is an HCAT with Scientific attachment, the Scientific One General Research Armored Trailer (SOGRAT).

The team has several caches in the area, but would expect most of its support to come from a Rail Center. The team suspects that this center is near the Colorado River and has the resources to build a new bridge across it. The team is familiar with common rail equipment, and is quite efficient at repairing and replacing railroad track, although the job is much faster when a large (non-team) work crew is available...

For the Project Director:

The War

Besides having enough warheads hitting the Los Angeles area to make the rubble bounce, the only warhead to hit the area was an SS-17 airburst over the center of Fort Irwin. Needless to say, There were not a lot of refugees from the Los Angeles or San Diego areas. For a few years, Barstow hung on, and was absorbed by the Republic of California (see Twilights Last Gleaming). However, the plans for rebuilding a bridge across the Colorado never came to fruition. As the Republic struggled for existence, Barstow's strategic location faded as well. When the Republic finally collapsed in 2010, Barstow had become a ghost town. The working solar generator (Solar 3) was dismantled and taken to Bakersfield, never to be reassembled.

The Area

One hundred and fifty years (or so) have passed, and the High Desert is very much that--a desert. However, the cooling of the climate would make things better, but it doesn't matter since it is now the dead of winter and a bit cold. There isn't anyone around almost literally for a hundred miles--there are a few "Indians" by the Colorado River, plus some to the south by Coachella, which is now adjacent to the Salton Sea. Barstow, or what's left of it, is in better shape than the Ghost Town of Calico just a few miles away, but not by much. The rail lines are somewhat preserved, but would require a great deal of maintenance and repair before they would ever pass rail traffic again.

The nearby military bases are empty, barren land. These large areas were used to train troops, but there is little evidence left that such took place. Most military hardware was recovered by the Republic many, many years ago. However, there are some rusted-out tanks and armored personnel carriers, plus twisted wreckage of unknown origin, at Fort Irwin. These were the victims of an airburst over the site during the war.

Mojave

Things are a little different around Mojave. There is some trade between it, Bishop County and Bakersfield. Mojave still receives water from the Los Angeles Aquaduct. The town "officially" belongs to Bishop County, and pays taxes to it. This irks the townspeople to no end, but those taxes "pay" for the water, so nothing is done about it. Also, the people are a little bit worried about Bakersfield's rise in power, which could mean another war to reunify California. While Bakersfield is dependent on Mojave's technology and know-how, Mojave is dependent on resources under Bakersfield's control (electricity, oil, metal, etc), and it is unclear whether or not either would survive a drawn-out war, and thus the status quo remains.

While Mojave does have know-how, a lot of it isn't in demand. For instance, they have the ability to make most chemicals, but only the ones worth the expense of transporting are worth making

in any quantity. This is a catch-22 situation, since the high price at the destination limits the quantity that can be purchased. Heavy machinery is not beyond them, but most work is put into keeping electrical generators and water pumps operational.

Note: Farmers distrust any water coming down from what is left of the California aquaduct, since at one time it was heavily contaminated from a nuclear hit on Merced to the north. This is no longer the case, but it has been so long since it was cleared of debris should anyone start using it, it would practically dry out.

The town is not very organized. It is relatively populous because the local farmers have access to farm equipment, fertilizers, and pesticides, and thus most residents of the area live in town.

Bakersfield

Bakersfield was the capitol of the Republic of California while it existed. It collapsed because it tried to hold onto too much.

It spent a lot of effort to keep together a state that had been cut into three distinct areas by the bombs: Northern, which was cut off by the San Francisco/Sacramento bombings, Central, which was most of the state south of that, and Southern, which included some populated areas outlying the Los Angeles/San Diego area, which were cut off by mountains and nuclear strikes. Southern had the most population, but the effort to evacuate these survivors from encroaching radiation was met with strong resistance from Central, which was barely making it on its own. Northern couldn't get or give much help, although some contact was maintained by sea from the ports of Morro Bay and Eureka. Northern became overwhelmed by refugees from the San Francisco area, and so was the northern part of Central. The National Guard was called on to keep the migrations manageable, and finally things fell apart.

Twenty years ago, "Governor" Lake began a ruthless consolidation of power in Bakersfield. One of the first acts was to gain control of the oil fields there, which had been run by a wealthy group of families for many, many years. With those revenues he began an education campaign for his supporters, with some trickle down to the population at large. Governor Lake now has a some "knowledge" but is only now getting to practice it. Barstow tries very hard to have its people in place to run or repair vital equipment. Lake thinks this is very selfish and tells his people so. In fact, he is slowly building a justification for war, to take what is "rightly" theirs. Lake is also getting old and wants to be the one to reunify California.

Lake is very much an "end justifies the means" sort of person. He believes California (and the United States) needs to become one again, and the only sure way to do it is militarily. He

still controls the military equipment left from before the war. Although most of it doesn't work, he has quite enough rifles and howitzers to take on any other force in California. Providing ammunition could be a problem, though...

Lake is perhaps five years away from taking over Mojave. He knows that Bishop County can't mount a force to stop him, even if they had warning. They're too far away. With the resources of Mojave, he believes he could quickly control the Central area except for Bishop County, and then could threaten them into submission.

BISHOP COUNTY

This is the name given to the region north of Mojave, up the Owens Valley and north into Bishop. It is primarily an agricultural region now that the Los Angeles aquaduct no longer sends its water to Los Angeles. It is also very protected, since it is flanked on two sides by the Sierras, and Nevada desert on the north. This has allowed a relatively representative government to survive, but it is very weak. It pretty much allows towns to do as they please, as long as they hold elections for mayor every few years. A party of "civic observers" from various towns go to observe the elections, but it is questionable how observant they really are.

Bishop County also holds various mineral deposits, thanks to active volcanism among other things. Transport is typically horse-drawn wagons utilizing the intact rail line, with an occasional steam engine. There were plans for an electric trolley, but the electrical costs made it impractical. There is some banditry, but not in any serious sense. It's more like mugging the non-local population...

Situation: The Team

The team wakes up in a somewhat normal manner. It takes a while for their eyes to adjust to the seemingly blinding (actually quite dim) lights. They nearly fall out of the freeze tubes, being so weak and dizzy. After struggling with their clothes, and they start looking at one another, they know something is wrong-- they're all thin, pale, and have regrown some of the hair that was shaved when they were frozen. There is a fine film of grime on everything, and not all the lights are working.

Looking for the reason for wakeup, the error code corresponds to "Bolt Hole Power Supply Unreliable" (it is nearly out of fuel). Not long afterwards the lights cut out. After cursing the darkness, someone will likely "light a single candle", or in this case, a flashlight. The entire procedure of whatever goes on in the bolthole will likely be done with the vehicle's lights.

The periscope goes up to show night time, snow-covered open ground. Radiation is slightly above normal, and the "gas" detector has gone bad (from age). The autonav puts them near

Ludlow, which is what they expect.

A call to Prime Base will elicit the following response:
"We read you team IS-2. Code Indigo. Repeat, Code Indigo. We will recontact at the standard time."

Code Indigo means a potentially hostile party may be listening in. Normal procedure is to switch scrambling codes, use a directional antenna, and reduce transmission power to minimum. A quick scan will show none of the MP frequencies in use. Standard time means at 1am, according to procedure.

It is somewhat unusual that Prime did not issue the new scrambler codes according to another standard procedure. This will get the team confused, and possibly suspicious. What has happened will be explained if they receive the message that Prime sends them.

If the team makes contact at the 1am, they will be told to use the unit XO's code followed by the commander's. After punching a few buttons, and a few hellos, they get to find out what happened to Prime Base:

Prime base was knocked out of commission by a bio agent after the war. It was unable to send a delayed wakeup call, and now it is December 2142. Team N-6 (and now teams TN-1 and TN-2) have partially reactivated the base, but the life support system and logistics make it impossible to adequately staff it. In addition, the computers are scrambled and thus the small staff has to manually go through the paperwork in order to find out anything about the team.

While Prime Base does not know of any threats in the area (in fact they know nothing about California), a number of teams have run into groups hostile to the Morrow Project. It is possible that one of them was responsible for the demise of Prime Base, and has access to some Morrow Project equipment or even facilities. That is why the scrambler code was modified.

They have called on all Morrow teams to go and start a colony in the Snake River Valley in Idaho. However, it will be nearly impossible to relocate Prime Base. In fact, they are now worried that they will not be able to move enough equipment to make the colony successful. They are quite happy to have found a construction team, and would like for them to set up a rail link between a staging area near Prime to the colony site. They have already scouted a route, but found it could not be immediately used with what they had on hand. They still estimate that it would take the team's full equipment load, caches, and then some, plus a large workforce, in order to restore the rail link. Some of that workforce should be available as the colonists arrive, but work must also be done to build the colony itself. It is expected that this could take several years, and so the team shouldn't kill itself (figuratively or literally) trying to get

there immediately.

The team now has a goal. They COULD try to drive up there and link up with the Morrow teams in the Snake River Valley. It would be a long, slow journey, since the trailer rig does not perform well off road. Also, much of their equipment would have to be left behind. If the team tries this, have a slow, prolonged campaign, have them get snowed in and run out of food, etc. They'll make it, but in bad shape. They should lose the trailer, either in the winter due to getting stuck, or capsizing in the water during any other time. The HCAT shouldn't have a problem on its own. If they just take the HCAT and link up, they can look over the route before deciding that they would need serious help to get it operational. The Morrow Colony planners may wait a few years and then decide they need it done, and send some teams south to possibly enlist California's help.

The team may decide to check out its caches. Two of the big ones are for the bypass equipment for Barstow and Mojave. A lot of the trackbed has already been laid clandestinely, and the team may be surprised to find that a whole rise was artificially made to house a coal-powered locomotive, coalcar, bunk cars, and boxcars filled with various equipment. Despite the protective measures, the team will figure that it would take several months to get them in operating condition. This may make them seriously consider how they can take these goodies with them. It should be noted that there isn't a lot of coal buried with this engine, and they would have to find a supply to get very far with it.

What is the team to do? Obviously improving the rail network in California will make the state much better off, but it also could lead to a takeover by a dictator. Governor Lake may not much appreciate some outsider coming in and telling him what he should do. He may decide that with the Morrow Project's help, he could reunite much of the country--his way.

Also, while it would be in Mojave's best interest to link up the Morrow Project, it may not seem so to them. They would lose their monopoly on "high technology", and they will probably believe that anything profitable that they do will be imitated by the Project at a cheaper price. They may be right. On the other hand, they may make out like bandits for rail equipment contracts, and even rolling stock.

What does Bishop County have to offer? Maybe cheap labor, but for that they would need a more efficient agriculture program. Barstow has the elements, and with a rail link it would be possible.

All the elements are there for a new power to emerge in California. The team has a chance on deciding just what that power will look like, and whether or not it is friendly to the Project. If the rail link to the north is successful, the new California may want to build out to Arizona, New Mexico, and the

Republic of Texas...

Secondary Morrow Project Sites

As mentioned in TM 1-1, many sites suitable for use by the Morrow Project exist. The businesses run by the Council of Tomorrow included facilities which were sited in areas not likely to be destroyed and would be useful during the reconstruction effort.

1) Steel Mill

This mini-mill uses electric furnaces and scrap steel to make new steels, then roll, press, and machine them. The Project buried a fusion reactor nearby. There was a plan for a bomb shelter for the workers and their families, but economic pressures forced the mill to close years before the war. This facility, once reactivated, could produce anything from steel rails to flat plate. Nearby equipment adds the capability for making braided cable, nails, and even small arms and shell casings.

While the team is familiar with some of the operations of the machine tools, they do not have the proper knowledge and experience to run the mill and get a consistent, high-quality product. It would take several months by a few local smiths and a work crew of 50 to get the facility totally operational.